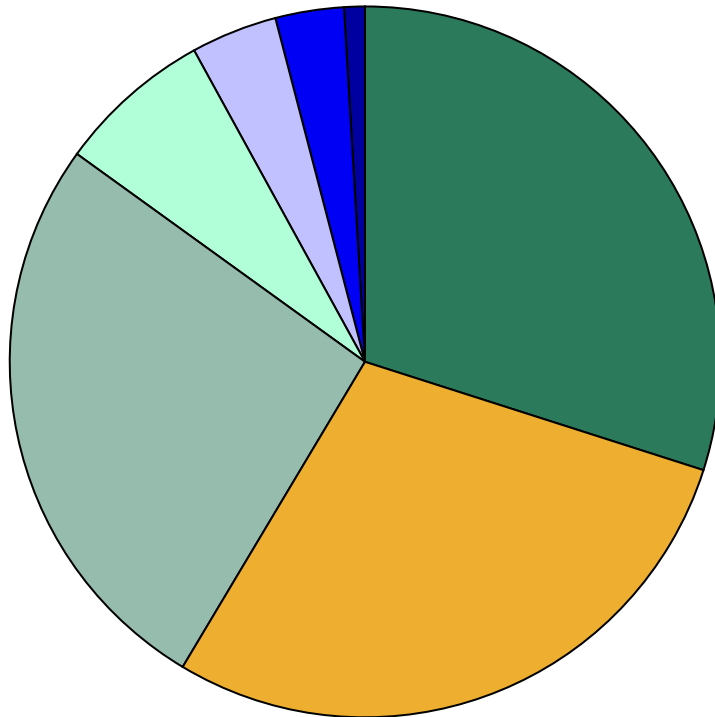


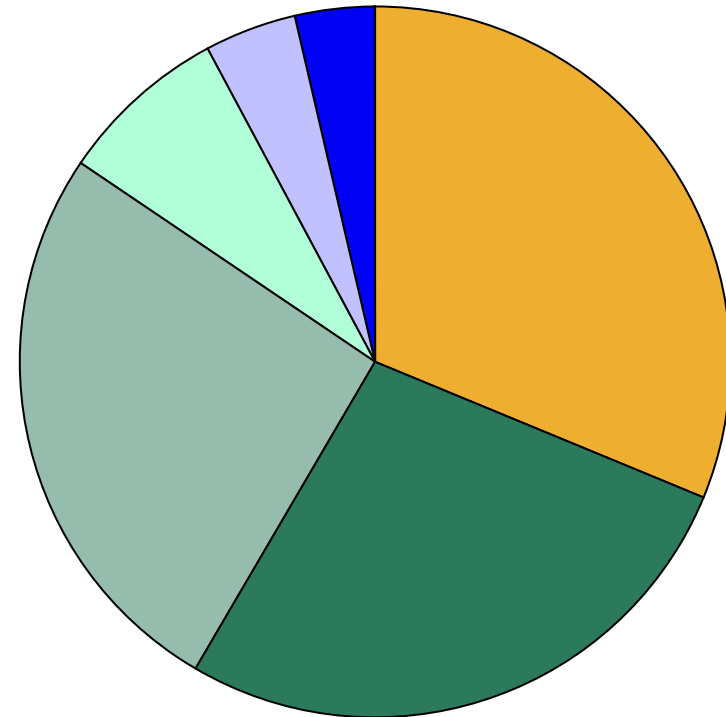
As of December 31, 2018

September 30, 2018 : \$2,377,556,728

December 31, 2018 : \$2,130,130,815



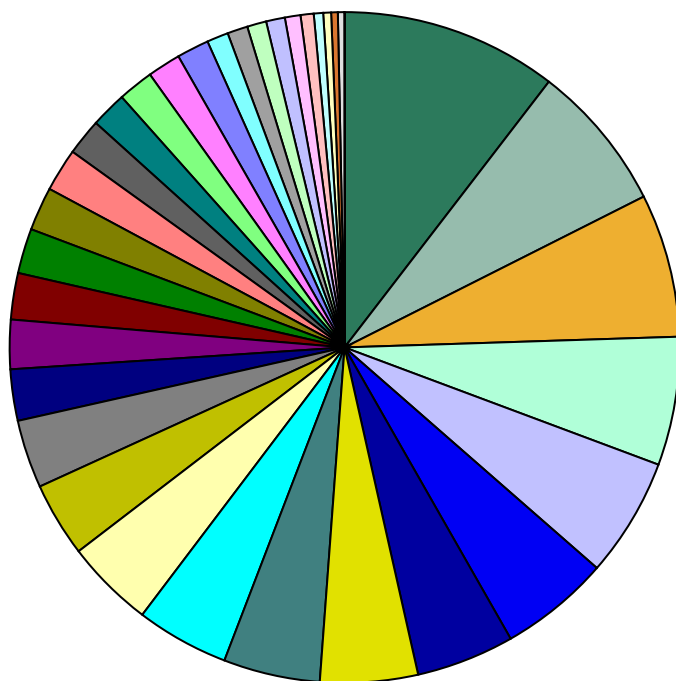
	Market Value (\$)	Allocation (%)
Domestic Equity Composite	711,484,910	29.93
Fixed Income Composite	681,268,376	28.65
International Equity Composite	626,958,074	26.37
Total Real Estate Composite	167,939,309	7.06
Hedge Fund Composite	93,311,797	3.92
Private Equity Composite	74,032,960	3.11
In House Cash	22,561,302	0.95



	Market Value (\$)	Allocation (%)
Fixed Income Composite	665,188,898	31.23
Domestic Equity Composite	579,569,067	27.21
International Equity Composite	554,236,314	26.02
Total Real Estate Composite	164,560,455	7.73
Hedge Fund Composite	89,048,510	4.18
Private Equity Composite	77,282,960	3.63
In House Cash	244,611	0.01

As of December 31, 2018

December 31, 2018 : \$2,130,130,815



	Market Value (\$)	Allocation (%)
Brandywine	222,346,002	10.44
Mackay Shields	152,016,020	7.14
Rhumblin S&P 500	147,230,071	6.91
Barrow, Hanley	131,985,560	6.20
1607 Capital Partners	122,259,926	5.74
Marathon Asset Mgmt	113,450,729	5.33
J.P. Morgan Global Emerging Markets Discovery Fund	100,724,491	4.73
Smith Graham	100,238,697	4.71
Prudential Core Conserv Bond	99,239,449	4.66
Acadian EM Equity II	95,363,398	4.48
PIMCO	91,348,731	4.29
Principal Global Investors	76,382,647	3.59
Winslow Capital Management	70,155,703	3.29
NTGI S&P 400	52,729,155	2.48
BlackRock US Core Property Fund	50,532,999	2.37
Rhumblin Russell 1000 Growth	47,638,038	2.24
Strategic Global Advisors	46,055,122	2.16
Grosvenor Institutional Partners, L.P.	44,812,750	2.10
Aetos	44,235,760	2.08
Conestoga Capital Advisors	37,585,195	1.76
Capital Prospects LLC	37,032,458	1.74
Pantheon Global Secondary Fund V	36,502,845	1.71
NB Crossroads Fund XXI	34,128,093	1.60
Nicholas Investment Partners	33,092,539	1.55
SouthernSun	22,120,348	1.04
TA Realty Fund XI	20,930,134	0.98
Long Wharf RE Partners V, L.P.	19,779,097	0.93
Gerding Edlen Green Cities III, L.P.	19,232,609	0.90
RREEF REIT II	16,099,733	0.76
Vanguard REIT Index Inv	13,444,234	0.63
Long Wharf Real Estate Partners IV, L.P.	9,681,274	0.45
Cornerstone (Barings) Real Estate Advisers Fund X	8,099,667	0.38
Mesirow Real Estate Value Fund III, L.P.	6,730,910	0.32
SSM Partners Growth Equity II L.P.	6,652,022	0.31
In House Cash	244,611	0.01
Cornerstone (Barings) Real Estate Advisers VIII	29,798	0.00

# City of Memphis

## Asset Allocation Comparison

Portfolio Value 12/31/18

\$2,130,130,815

### Target Allocations

#### Equity

		(000)	<u>Current Managers &amp; Allocations</u>		(000)	<u>Difference</u>	<u>Range</u>
Large Cap Equity	17.00%	\$362,122	Barrow, Hanley (large cap value)	6.20%	\$131,986	<b>1.64%</b>	<b>13%-21%</b>
			Rhumblin Russell 1000 Growth (large cap growth)	2.24%	\$47,638		
			Winslow (large cap growth)	3.29%	\$70,156		
			Rhumblin S&P 500 (large cap core)	6.91%	\$147,230		
Mid/SMID Cap Equity	5.00%	\$106,507	Northern Trust (mid cap core)	2.48%	\$52,729	<b>-0.79%</b>	<b>0%-7%</b>
			Capital Prospects SMID Cap*	1.74%	\$37,032		
Small Cap Equity	5.00%	\$106,507	SouthernSun (small cap value)	1.04%	\$22,120	<b>-0.64%</b>	<b>0%-7%</b>
			Conestoga (small cap growth)	1.76%	\$37,585		
			Nicholas (small cap growth)	1.55%	\$33,093		
<b>Domestic Equity</b>	<b>27.00%</b>	<b>\$575,135</b>	<b>Domestic Equity</b>	<b>27.21%</b>	<b>\$579,569</b>	<b>0.21%</b>	<b>17%37%</b>
Developed International	18.50%	\$394,074	1607 Capital Partners	5.74%	\$122,260	<b>-1.69%</b>	<b>14%-23%</b>
			Principal Global Investors	3.59%	\$76,383		
			Marathon Asset Mgmt	5.33%	\$113,451		
			Strategic Global Advisors	2.16%	\$46,055		
Emerging Markets	8.50%	\$181,061	Acadian	4.48%	\$95,363	<b>0.71%</b>	<b>5%-12%</b>
			JPMorgan	4.73%	\$100,724		
<b>International</b>	<b>27.00%</b>	<b>\$575,135</b>	<b>International</b>	<b>26.02%</b>	<b>\$554,236</b>	<b>-0.98%</b>	<b>17%-37%</b>
<b>Equity Total</b>	<b>54.00%</b>	<b>\$1,150,271</b>	<b>Equity Total</b>	<b>53.23%</b>	<b>\$1,133,805</b>	<b>-0.77%</b>	
<u>Fixed Income</u>							
Core Fixed Income	12.00%	\$255,616	PIMCO	4.29%	\$91,349	<b>1.65%</b>	<b>7%-17%</b>
			Prudential Core Conserv Bond	4.66%	\$99,239		
			Smith Graham	4.71%	\$100,239		
Global Fixed Income	10.00%	\$213,013	Brandywine	10.44%	\$222,346	<b>0.44%</b>	<b>3%-13%</b>
Global High Yield	6.00%	\$127,808	Mackay Shields	7.14%	\$152,016	<b>1.14%</b>	<b>3%-13%</b>
<b>Fixed Income Total</b>	<b>28.00%</b>	<b>\$596,437</b>	<b>Fixed Income Total</b>	<b>31.23%</b>	<b>\$665,189</b>	<b>3.23%</b>	<b>20%-36%</b>

\* Emerging Manager

**Real Estate**

Core/Value Add/REITs	10.00%	\$213,013	BlackRock US Core Property Fund	2.37%	\$50,533		
			RREEF REIT II	0.76%	\$16,100		
			Vanguard REIT Index	0.63%	\$13,444		
					</		

<b><i>Real Estate Total</i></b>	<b>10.00%</b>	<b>\$213,013</b>	<b><i>Real Estate Total</i></b>	<b>7.73%</b>	<b>\$164,560</b>	<b>-2.27%</b>	<b>5%-10%</b>
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**Private Equity**

Secondary	2.00%		Pantheon Global Secondary Fund V	1.71%	\$36,503	(Total Commitment \$50M, Total Drawn \$33.7M, Total Distributed \$9.5M)	
Direct Private Equity			SSM Partners V*	0.31%	\$6,652	(Total Commitment \$10M, Total Drawn \$5.6, Total Distributed \$0.0M)	
Diversified FoF	2.00%		Neuberger Berman Crossroads XXI	1.60%	\$34,128	(Total Commitment \$50M, Total Drawn \$29.5M, Total Distributed \$0.0M)	

<b><i>Private Equity Total</i></b>	<b>4.00%</b>	<b>\$85,205</b>	<b><i>Private Equity Total</i></b>	<b>3.63%</b>	<b>\$77,283</b>	<b>-0.37%</b>	<b>2%-6%</b>
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**Hedge Fund of Funds**

	4.00%		Aetos	2.08%	\$44,236		
			Grosvenor	2.10%	\$44,813		
<b><i>Hedge Fund of Funds Total</i></b>	<b>4.00%</b>	<b>\$85,205</b>	<b><i>Hedge Fund of Funds Total</i></b>	<b>4.18%</b>	<b>\$89,049</b>	<b>0.18%</b>	<b>2%-6%</b>

Internal Account	0.00%	\$0	Internal Account	0.01%	\$245		
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<b><i>Cash</i></b>	<b>0.00%</b>	<b>\$0</b>	<b><i>Cash</i></b>	<b>0.01%</b>	<b>\$245</b>	<b>0.01%</b>	<b>0%-5%</b>
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<b>Total</b>	<b>100%</b>	<b>\$2,130,131</b>	<b>Total</b>	<b>100%</b>	<b>\$2,130,131</b>		
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<sup>1</sup> Cornerstone Real Estate Advisers now operates under the investment adviser name "Barings Real Estate Advisers," however; all predecessor funds retain the name Cornerstone. All new products open to new investors will operate under the name "Barings Real Estate Advisers" moving forward.

\* Emerging Manager

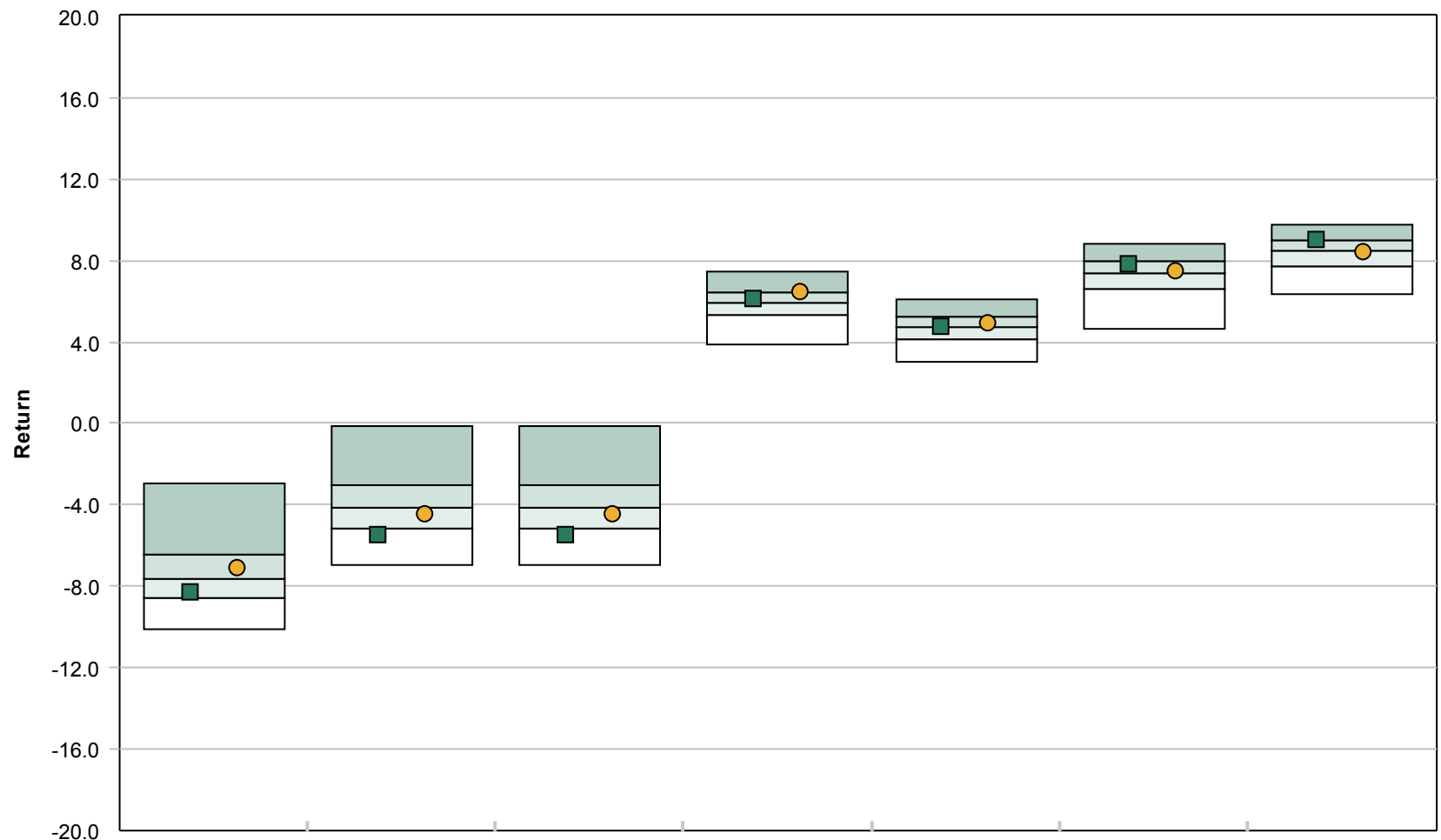
As of December 31, 2018

	Performance (%)								
	1 Quarter	Year To Date	1 Year	3 Years	5 Years	7 Years	10 Years	Since Inception	Inception Date
<b>Total Fund Composite</b>	<b>-8.31</b>	<b>-5.54</b>	<b>-5.54</b>	<b>6.06</b>	<b>4.77</b>	<b>7.79</b>	<b>9.03</b>	<b>9.27</b>	<b>10/01/1982</b>
Policy Index	-7.09	-4.45	-4.45	6.40	4.94	7.45	8.39	9.72	
In House Cash	0.58	1.93	1.93	0.98	0.65	0.51	0.48	4.17	10/01/1982
90 Day U.S. Treasury Bill	0.56	1.87	1.87	0.99	0.61	0.45	0.35	3.90	
<b>Domestic Equity Composite</b>	<b>-16.13</b>	<b>-5.88</b>	<b>-5.88</b>	<b>8.29</b>	<b>6.41</b>	<b>11.56</b>	<b>12.66</b>	<b>11.51</b>	<b>10/01/1982</b>
Russell 3000 Index	-14.30	-5.24	-5.24	8.97	7.91	12.46	13.18	11.32	
<b>Fixed Income Composite</b>	<b>-0.73</b>	<b>-0.98</b>	<b>-0.98</b>	<b>3.64</b>	<b>3.06</b>	<b>3.35</b>	<b>5.69</b>	<b>7.41</b>	<b>10/01/1982</b>
Blmbg. Barc. U.S. Aggregate	1.64	0.01	0.01	2.06	2.52	2.10	3.48	7.21	
<b>International Equity Composite</b>	<b>-11.57</b>	<b>-15.54</b>	<b>-15.54</b>	<b>5.16</b>	<b>2.74</b>	<b>7.54</b>	<b>8.45</b>	<b>4.85</b>	<b>01/01/1990</b>
MSCI EAFE (Net)	-12.54	-13.79	-13.79	2.87	0.53	5.75	6.32	3.98	
MSCI AC World ex USA (Net)	-11.46	-14.20	-14.20	4.48	0.68	4.85	6.57	N/A	
<b>Hedge Fund Composite</b>	<b>-4.57</b>	<b>-1.45</b>	<b>-1.45</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>4.18</b>	<b>04/01/2016</b>
90-Day T-Bill+ 5%	1.80	6.97	6.97	6.04	5.64	5.47	5.37	6.11	
<b>Core Private Real Estate Composite</b>	<b>-0.19</b>	<b>4.91</b>	<b>4.91</b>	<b>7.04</b>	<b>10.51</b>	<b>10.59</b>	<b>7.42</b>	<b>8.29</b>	<b>09/01/1999</b>
NCREIF Property Index	1.37	6.72	6.72	7.21	9.33	9.74	7.49	8.93	

As of December 31, 2018

	Performance (%)									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
<b>Total Fund Composite</b>	<b>18.29</b>	<b>6.77</b>	<b>0.25</b>	<b>5.55</b>	<b>17.71</b>	<b>13.75</b>	<b>0.72</b>	<b>14.05</b>	<b>22.23</b>	<b>-28.95</b>
Policy Index	16.72	8.00	-0.19	5.86	15.19	12.79	0.77	12.11	19.76	-22.15
In House Cash	0.67	0.35	0.18	0.11	0.11	0.20	0.54	0.36	0.34	2.85
90 Day U.S. Treasury Bill	0.86	0.25	0.03	0.04	0.05	0.08	0.08	0.13	0.17	2.10
<b>Domestic Equity Composite</b>	<b>22.62</b>	<b>10.04</b>	<b>-1.26</b>	<b>8.80</b>	<b>35.55</b>	<b>16.30</b>	<b>0.65</b>	<b>18.23</b>	<b>28.67</b>	<b>-38.44</b>
Russell 3000 Index	21.13	12.74	0.48	12.56	33.55	16.42	1.03	16.93	28.34	-37.31
<b>Fixed Income Composite</b>	<b>6.94</b>	<b>5.14</b>	<b>-0.23</b>	<b>4.70</b>	<b>0.13</b>	<b>8.15</b>	<b>6.69</b>	<b>8.81</b>	<b>18.96</b>	<b>-12.34</b>
Blmbg. Barc. U.S. Aggregate	3.54	2.65	0.55	5.97	-2.02	4.21	7.84	6.54	5.93	5.24
<b>International Equity Composite</b>	<b>33.29</b>	<b>3.30</b>	<b>-0.50</b>	<b>-1.08</b>	<b>20.79</b>	<b>20.28</b>	<b>-12.77</b>	<b>13.91</b>	<b>36.19</b>	<b>-44.94</b>
MSCI EAFE (Net)	25.03	1.00	-0.81	-4.90	22.78	17.32	-12.14	7.75	31.78	-43.38
MSCI AC World ex USA (Net)	27.19	4.50	-5.66	-3.87	15.29	16.83	-13.71	11.15	41.45	-45.53
<b>Hedge Fund Composite</b>	<b>6.79</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
90-Day T-Bill+ 5%	5.90	5.27	5.03	5.04	5.05	5.08	5.09	5.14	5.17	7.20
<b>Core Private Real Estate Composite</b>	<b>7.75</b>	<b>8.50</b>	<b>11.92</b>	<b>20.06</b>	<b>7.12</b>	<b>14.60</b>	<b>13.01</b>	<b>22.87</b>	<b>-27.15</b>	<b>-14.89</b>
NCREIF Property Index	6.96	7.97	13.33	11.82	10.98	10.54	14.26	13.11	-16.85	-6.46

As of December 31, 2018



■ Total Fund Composite

● Policy Index

5th Percentile

1st Quartile

Median

3rd Quartile

95th Percentile

Parentheses contain percentile rankings.  
Calculation based on quarterly periodicity.